



Physico-Chemical Composition and Sensory Characteristics of Biscuit from Wheat-Fluted Pumpkin Seed and Juice

Ochulor, D.O, Duru, F.C Oparaku, O, Okpolor, S.U, Emurigho, T.A, Nwariem, S.M Nnaji, K.C & Ejelonu, N.C

Department of food Technology,

Federal Polytechnic, Nekede, Owerri, Imo State

Email- ejelonunelson@gmail.com

ABSTRACT

Biscuits were produced from flour of wheat fluted pumpkin seed and juice at different ratios of 100:0, 90:5:5, 80:10:10, 70:15:15 and 50:25:25 of wheat, fluted pumpkin juice and fluted pumpkin seeds respectively. The biscuits were analyzed for the physicochemical and organoleptic characteristics and the result of the proximate composition; moisture ranged from (6.02 to 6.10%), ash ranged from (1.95 to 2.03%), fat ranged from (2.79 to 3.21%), crude protein ranged from (8.01 to 11.11%), crude fibre ranged from (1.48 to 1.60%) and CHO (75.95 to 79.75). The physical properties revealed that for thickness ranged from (0.19 to 0.25)mm, diameter ranged from (5.02 to 5.21)mm, weight ranged from (7.58 to 8.57)mm spread ratio ranged from (20.87 - 2686)mm. The physical analysis showed slight difference among samples. The sensory result also showed very slight difference among samples. The study recommends that wheat flour with pumpkin seed flour and from seed and juice be used in baking applications to increase cheap products to yield better enriched product.

Keywords: Proximate composition, biscuit, wheat, pumpkin seed and juice.

INTRODUCTION

Biscuit are one of the popular cereal food foods apart from bread consumed in Nigeria. They are ready to eat, convenient and unexpensive food products, containing digestive and dietary principle of vital importance. They are nutritive snacks obtained from unpalatable dough through the application of heat in oven (oluwanukomi et al, 2011). The main ingredients generally used for biscuit production is wheat flour with other ingredients such as margarine, sweeteners, leavening agents, egg, milk, salt and flours

(Adbowale et al, 2012). Fluted pumpkin (*Telfairaoccidentalis*) is a tropical vine with large lobed leaves and long twisting tendrils. The seed of fluted pumpkin and the pulp are both valuable as an oil seed and also its protein with a fairly well balanced amino acid composition (Ejike et al, 2010).

Pumpkin fruit is rich in minerals, vitamins, pectin, dietary fibre and vital antioxidants like carotenoid, lutein and other polyphenols, therefore the flour could be used to supplement cereal flours in baking products to improve nutritional physical and sensory qualities (Yadav et al, 2010). Lee et al, 2002. Wheat (*Triticumactivum*) is a cereal grain grown all over the world for its highly nutritious and useful grain. According to Okakor, 2005. Only wheat contain substantial amount of gliadin and gluten (special protein) which when needed with given gluten the elastic material important in yeast or acratial baked goods. In terms of total production tonnages used for, it is currently second to rice as the main human food crop and a head of maize, after allowing for maize more extensive use in animal feed (Curtis et al, 2002). This flour can be utilize in the production of biscuit as a composite flour to improve the nutritional value of biscuit and reduce the cost of important of wheat flour which is the main ingredient in biscuit baking.

MATERIALS AND METHODS

Materials

Materials used for production are wheat flour, fluted pumpkin pulp and seed, egg, baking powder, preservation.

Production of Fluted Pumpkin Pulp

The ripe pumpkin fruit were washed, peeled seeds removed and cut into small pieces



The preparation of the material was done in food Technology laboratory grade federal polytechnic Nekede.

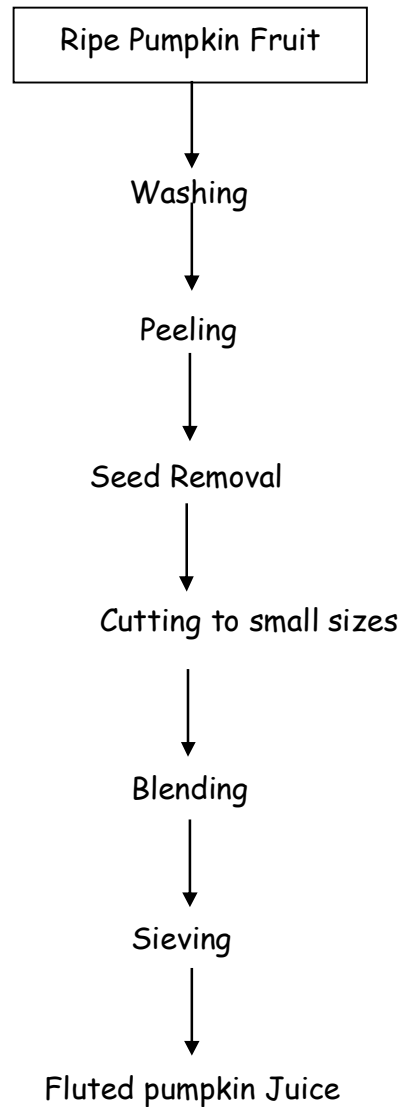


Fig. 1 Flow chart of fluted pumpkin pulp (Hammed et al, 2008)

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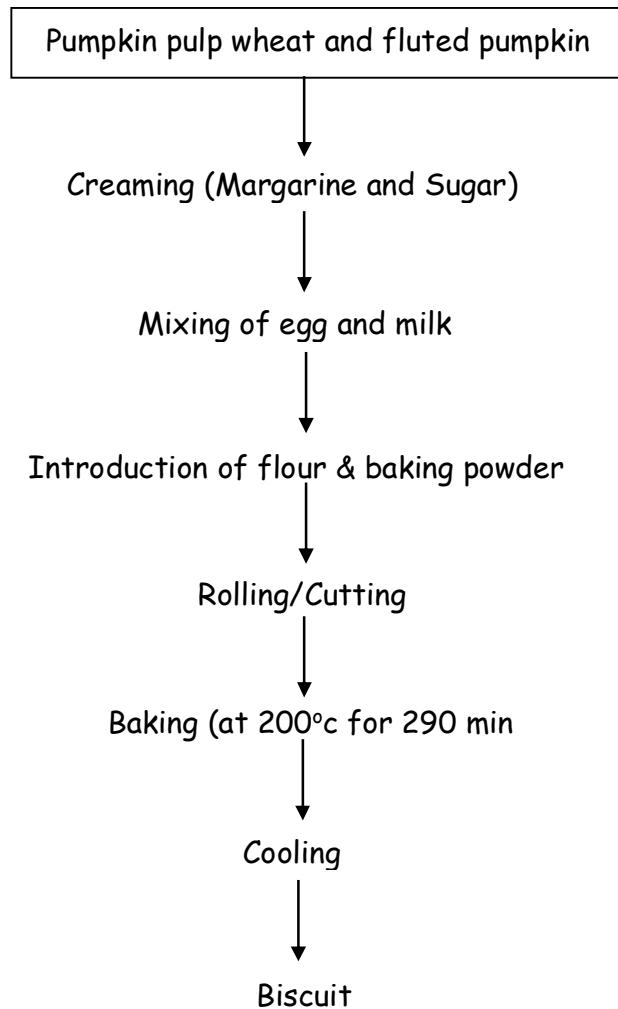


Fig 2. Flow chart for the Biscuit production (Okaka et al, 1997)

Production of Biscuit for Samples Pumpkin Juice and Seed

The margarine and sugar is beater together until the mixture is light in colour and fluffy then sugar dissolved. The whisked egg is added to the fluffy mixture and mixed properly. The mixture is now divided into the number of samples and the samples added differently according to their ratio, then other like baking powder, milk, salt and preservative mixed till it is smooth. The mixture is then cut in shapes and baked in pans after labelling for oven for 140°C for 45 mins.



Proximate Analysis of Biscuit Produced with Wheat and Pumpkin Seed and Juice

The proximate analysis were determine using standard methods of the Association of official Analytical Chemists (AOAC, 2010) and the parameters were tested and calculated moisture, ash, crude fibre, fat crude protein and CHO. Analysis were carried out in triplicates.

Physical Analysis Determination

The Physical Analysis of the samples were carried out are;

The weight of the biscuit samples was obtained using a weighing balance. The diameter and height were measured using a calibrated ruler as described by (Agu et al, 2007). The spread ratios were determined using the ratio of diameter to height (Giami et al, 2004). The break strength of the biscuit samples was determined using Okaka and Isiel (1990) method. The biscuit was placed centrally between two parallel metal bars (3cm apart) weights were added on the biscuit until the biscuit snapped. The least weight that caused the breaking of the biscuit was regarded and the break strength of the biscuit.

Sensory Evaluation

The sensory evaluation was done using a twenty-member panel of judges drawn from the polytechnic community. The panelists were made to work under carefully controlled condition to avoid judgment. The samples were presented in coded serving plates.

9-point shedonic scale was used for the evaluation as follows;

9 like extremely, 8 like very much

9 like moderately 6- like slighty

5 neither like no dislike 4- dislike slightly

3 dislike moderately 2 dislike very much

1 dislike extremely by Ihekoronye and Ngoddy (1985).

Statistical Analysis

All the results obtained were subjected to statistical analysis using analysis of variance to determine significant differences among biscuit samples. Least significant difference was calculated to ascertain which samples were significantly different.

RESULT AND DISCUSSION

Table 1: Result of the proximate composition of biscuit produced from wheat and pumpkin seed and juice.

Sample code	Parameters %					
AOA	Moisture	Ash	Fat	Protein	Fibre	Carbohydrate
BOB	6.01 ^a	1.95 ^c	2.79 ^a	8.01 ^c	1.48 ^a	79.75 ^a
	± 0.01	± 0.02	± 0.01	± 0.01	± 0.01	± 0.02
COC	6.03 ^a	1.97 ^a	2.91 ^b	8.66	1.50 ^a	78.93 ^a
	± 0.02	1.01	± 0.01	± 0.02 ^a	± 0.01	± 0.02
DOD	0.09 ^a	2.10 ^a	3.11 ^a	9.89	1.55	77.35 ^a
	±0.01	±0.01	±0.22	±0.01	±0.01	±0.01
EOE	6.10	2.03	3.21	11.11 ^a	1.60	75.95
	±0.01	±0.01	±0.01	±0.01	±0.04	±0.01
LSD	0.56	0.12	0.32	0.14	2.04	3.7

Table 2: Physical properties of biscuit produced from wheat fluted pumpkin flour and juice

Sample	Thickness	Diameter	Weight	Spread ratio
AOB	0.25 ^a	5.21 ^a	8.57 ^a	20.87 ^b
	±0.01	±0.02	±0.02	±0.02
BOB	0.24 ^a	5.10 ^a	8.52 ^a	21.27 ^b
	±0.02	±0.01	±0.02	±0.02
COC	2.23 ^a	5.21 ^a	8.51 ^a	22.69 ^a
	±0.01	±0.02	±0.01	±0.01
DOD	0.22 ^a	5.02 ^a	7.64 ^a	22.86 ^a
	±0.02	±0.01	±0.01	±0.01
EOE	0.19 ^a	5.08	7.58 ^b	26.82 ^a
	±0.02	±0.02	±0.01	±0.01
LSD	0.12	0.18	0.95	5.50



Table 3: Sensory properties of biscuit produced from wheat-fluted pumpkin seed and juice

Samples	Parameters Taste	Texture	Colour	Flour	General acceptability
AOA	7.3 ^a	6.7 ^b	8.0 ^a	5.6 ^a	7.4 ^a
BOB	7.2 ^a	6.8 ^a	6.9 ^b	7.0 ^a	7.3 ^b
COC	6.0 ^b	5.9 ^c	5.7 ^a	5.0 ^a	6.3 ^c
DOD	6.0 ^c	5.8 ^a	6.0 ^c	5.4 ^b	6.0 ^a
EOE	6.0 ^a	6.4 ^a	5.1 ^a	6.3 ^a	6.2 ^a

DISCUSSION

PROXIMATE COMPOSITION

The proximate composition of biscuit produced with wheat-pumpkin seed and juice. The moisture content is slightly high. This is significantly shelf like and may affect keeping quality at (6.0166.5) % packaging and general acceptability (Okaka and Okaka, 2001). The ash content (1.95 to 2.30) % in high which is an indication of high mineral needed bone development, teeth formation and body function (Trachro and Mistry, 1998). Fat ranged from (2.79 to 3.21) %, this is slightly high which is an indication of better taste and mouth feel, it is an effective method of delivering fat soluble vitamins ADEK to the diet. Protein ranged from (8.01 to 11.11) % which is high therefore it is very good for children who consume more biscuits and for people with protein malnutrition, the increase in protein is as a result of addition of pumpkin which increased the total nitrogen content (Ohiwanyi et al, 2009).

The fibre in slightly high and therefore will take care of constipation and association disease like piles, appendicitis and colon cancer and also to lower serum cholesterol and control blood sugar⁴ and increase bulk stool (Okon 1983). The carbohydrate content is high which is good required for daily activities. The result for the physical analysis of biscuit from pumpkin revealed

that the thickness ranged from (0.19 to 0.2) mm therefore, there is no significant difference among samples. sample EOE had the least value while ADA had the highest, that is as the fluted pumpkin increases the thickness increase, this could be due to the water holding capacity of pumpkin seen. Diameter ranged from (5.01mm to 5.21mm), sample EOE had the lowest while AOA had the highest weight (7.58 to 8.57) and spoca ratio (20.57 to 26.82) with no significant difference due to high fibre. The sensory properties analysis revealed that there was significant difference among samples and as fluted pumpkin is added, all the parameters reduce except in sample EOE which does not agree with (Singh, 2008).

CONCLUSION

Pumpkin flour could be used to supplement flours in bakery, soups and noodles to improve nutritional physical and sensory qualities of baked products.

RECOMMENDATIONS

Pumpkin is incorporated to promote improved functional properties and improved nutritional qualities for diabetic patients and reduce cost of wheat importation.

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